

Reductions in HIV Risk–Associated Sexual Behaviors among Black Male Adolescents: Effects of an AIDS Prevention Intervention

ABSTRACT

Background. The number of reported cases of acquired immune deficiency syndrome (AIDS) is increasing disproportionately among Blacks in the United States. The relatively high incidence of sexually transmitted diseases among Black adolescents suggests the need for AIDS prevention programs to reduce their risk of sexually transmitted human immunodeficiency virus (HIV) infection.

Methods. Black male adolescents ($n = 157$) were randomly assigned to receive an AIDS risk reduction intervention aimed at increasing AIDS-related knowledge and weakening problematic attitudes toward risky sexual behavior, or to receive a control intervention on career opportunities.

Results. The adolescents who received the AIDS intervention subsequently had greater AIDS knowledge, less favorable attitudes toward risky sexual behavior, and lower intentions to engage in such behavior than did those in the control condition. Follow-up data collected 3 months later revealed that the adolescents who had received the AIDS intervention reported fewer occasions of coitus, fewer coital partners, greater use of condoms, and a lower incidence of heterosexual anal intercourse than did the other adolescents.

Conclusions. These results suggest that interventions that increase knowledge about AIDS and change attitudes toward risky sexual behavior may have salutary effects on Black adolescents' risk of HIV infection. (*Am J Public Health.* 1992;82:372–377)

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Introduction

Acquired immune deficiency syndrome (AIDS) has created a major health crisis. In the United States, over 179 000 cases of AIDS had been reported as of May 1991, with over 113 000 deaths attributed to the disease.¹ But these numbers represent only part of the problem. An estimated 1 million people have been infected by the human immunodeficiency virus (HIV), the cause of AIDS.^{2,3} These people, too, are likely to develop AIDS. Although HIV can be transmitted perinatally from infected mothers to their newborns, the risk of infection is primarily associated with two kinds of behaviors: (1) the sharing of contaminated hypodermic needles and other drug paraphernalia and (2) the exchange of semen, blood, or vaginal fluids during sexual activities.¹ The most promising method of curtailing the spread of AIDS is to reduce the frequency of high-risk behaviors.

In this paper we report the results of a field experiment employing an intervention designed to reduce the frequency of HIV risk–associated sexual behaviors among inner-city Black male adolescents. Although most reported AIDS cases in the United States involve White homosexual and bisexual men, Blacks are, in fact, disproportionately burdened by AIDS. Only 12% of the nation's population is Black, yet 28% of AIDS patients are Black.¹ Adolescents represent 1% of all reported AIDS cases in the United States. But this statistic may underestimate the potential for HIV infection among adolescents. Adults in their 20s constitute 20% of all reported AIDS cases, and because several years typically elapse between the time a person is infected with HIV and the appearance of clinical signs sufficient to war-

rant a diagnosis of AIDS, many of these young adults may have acquired the infection as adolescents.⁴

Statistics on rates of sexually transmitted diseases (STDs) and unintended pregnancy suggest that adolescents engage in sexual activities that heighten risk of HIV infection.^{5–11} Adolescents have higher rates of syphilis, gonorrhea, and pelvic inflammatory disease than do all other age groups. Inner-city Black adolescents, however, are particularly at risk: STDs are two to three times more common in inner-city populations, and the adolescent pregnancy rate is nearly twice as high among Blacks as among Whites. The prevalence of intravenous drug use in the inner city also heightens the risk of HIV infection for Black adolescent residents. Although the adolescents themselves may not use intravenous drugs—indeed, some data¹² indicate that intravenous drug use among adolescents is rare—they may have sexual relationships with intravenous drug users or with individuals who have had sex with such potentially infected persons.

Despite the potential risk of sexually transmitted HIV infection among inner-city Black adolescents, there is a dearth of intervention studies on behavior change in

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this population. More broadly, research into adolescents' sexual behavior, for the most part, has been conducted on female adolescents.¹³ Yet it is also important to understand the dynamics of male adolescents' sexual behavior. Male adolescents are more likely to initiate sexual activities with their partners,^{13,14-16} and the male's use of a condom is the best method to reduce the risk of contracting or spreading an STD during sexual activities.

Recent studies provide initial experimental evidence that AIDS prevention interventions emphasizing attitudes, knowledge, and skill-building can increase condom procurement among Black male adult STD patients¹⁷ and self-reported condom use among White male homosexuals.¹⁸ In an AIDS intervention study¹⁹ of Black and Hispanic adolescents, those in the intervention conditions, compared with those not receiving an intervention, showed increased ratings of the value of AIDS education and reduced approval of intravenous drug use 1 month after the intervention. DiClemente and colleagues²⁰ tested an AIDS education intervention on classes within middle and high schools in San Francisco and found that, compared with control classes, those that received the AIDS instruction had greater AIDS knowledge and less fear of being infected by classmates who have the disease. DiClemente et al.²⁰ urged behavioral assessments in future intervention studies on adolescents.

In the present study we examined whether Black male adolescents who were randomly assigned to an AIDS risk reduction intervention would have greater knowledge and less positive attitudes and intentions regarding risky sexual behavior than would those assigned to a control intervention on career opportunities. Most important, we also examined whether risky sexual behaviors would decline in the intervention condition, relative to the control condition, during the 3 months after the intervention.

Methods

Study Sample

The participants were 157 Black male adolescents (mean age = 14.64 years, SD = 1.66) from Philadelphia, Pa, who were recruited from among outpatients at a medical clinic in West Philadelphia (44%); students attending the 10th, 11th, and 12th grade assemblies at a local high school (32%); and adolescents at a local YMCA (24%). (The results do not differ as

a function how subjects were recruited.) About 97% of the participants were currently enrolled in school. The mean number of years of education of their mothers, as reported by participants, was 13.82 (SD = 3.17). Few participants (4.5%) reported ever sharing needles or ever having receptive anal intercourse (2.3%), or having sexual relationships with males exclusively (1.6%) or with both males and females (0.8%). Their chief HIV risk was from heterosexual activities. About 33.9% reported having more than one coital partner in the previous 3 months, and 12.8% of the respondents indicated that they had had heterosexual anal intercourse during that period. About 20.9% of the respondents who had had coitus in the previous 3 months reported that they never used condoms during those experiences, and only 30.2% reported always using condoms. The adolescents were offered \$40 for participating: \$15 for taking part in the intervention and \$25 for attending the 3-month follow-up. Of the original participants, 150 completed the 3-month follow-up questionnaire, for a return rate of 96%. The return rate was not different between experimental conditions.

Procedure

The study was approved by the human subjects committee of Princeton University. Adolescents and parents signed separate consent forms. They were given descriptions of the study that took into account the fact that the adolescents would be randomly assigned to an AIDS risk reduction intervention or to a career-opportunities intervention. The study was described as a risk reduction project, designed "to understand Black male youths' behaviors that may create risks such as unemployment, truancy, teenage pregnancy, and sexually transmitted diseases, especially AIDS, and to find ways to teach Black male youth how to reduce these risks."

The intervention session was held at a local school on Saturday, October 15, 1988. That morning, the participants completed preintervention questionnaires, which took about 90 minutes. Immediately before completing the questionnaires, the participants signed an agreement indicating that they understood that it was important to answer the questions carefully and honestly, that their answers would be confidential, and that their names would not be put on their questionnaires. The participants also signed such agreements before completing postintervention and follow-up questionnaires. Re-

search indicates that this procedure increases the accuracy of self-reports. While the participants completed the preintervention questionnaires, they were stratified by age and randomly assigned within age to either the AIDS condition or the career-opportunities condition and to one of 27 small groups (14 in the AIDS condition and 13 in the control condition) led by a trained male or female facilitator. A total of 85 adolescents were assigned to the AIDS condition, and 72 were assigned to the control condition. The sample sizes are smaller in some analyses because of attrition or because subjects gave no response to the question.

AIDS risk-reduction condition. Participants in the AIDS risk reduction condition received a 5-hour intervention designed to increase their knowledge of AIDS and STDs and to weaken problematic attitudes toward risky sexual behaviors. The intervention included information about risks associated with intravenous drug use and specific sexual activities. Videotapes, games, exercises, and other culturally and developmentally appropriate materials were used to reinforce learning and to encourage active participation. All materials had been extensively pilot tested and were selected not only to provide accurate information, but to do so in ways that would be interesting to inner-city Black male adolescents. For example, one video, "The Subject is AIDS," was narrated by a Black woman and had a multiethnic cast. In one game, "AIDS Basketball,"²¹ participants in small-group sessions were divided into teams that earned points for correctly answering factual questions on AIDS. In one exercise, "Uncle Bill's Advice Column,"²¹ pairs of adolescents wrote a response to a letter to Uncle Bill about AIDS or risky behavior and then read it to the rest of the group for discussion. A condom exercise focused on the correct use of condoms. The participants also engaged in role-playing situations depicting potential problems in trying to implement safer sex practices, including abstinence. A more detailed description of the intervention is available from the authors.

Career-opportunities condition. An important concern in designing this experiment was to control for Hawthorne effects to reduce the likelihood that effects of the AIDS intervention could be attributed to nonspecific features, including group interaction and special attention. A waiting-list or no-treatment control condition would not control for these confounding variables and consequently was seen

as undesirable. In addition, for ethical and methodological reasons, every effort was made to ensure that the experiences of control participants were as valuable and enjoyable as those of experimental participants.²² Accordingly, participants in the control condition received an intervention concerning career planning and opportunities. Structurally similar to the AIDS intervention, it also lasted 5 hours and used videotapes, small-group discussions, exercises, and games. The participants viewed the film "Career and You." In one game, "The Career Game," participants in small groups were divided into teams that earned points for correctly answering questions about careers. They participated in a value-awareness exercise, and they did a career analysis.

After the interventions, all participants completed the postintervention questionnaires. This took about an hour. To reduce the effects of demand characteristics, the questionnaires were administered by research assistants, not by the facilitators.

Facilitators

The facilitators were 27 Black adults (11 women and 16 men) with a mean age of 36.2 years ($SD = 6.8$). The AIDS facilitators had backgrounds in human sexuality education, mental health counseling, AIDS education, nursing, or social work. The career-opportunities facilitators had backgrounds in education, career guidance, or business. All facilitators had at least a 4-year college degree. A majority had experience with small-group facilitation.

One week before the intervention, the facilitators received 6 hours of training. AIDS and careers facilitators were trained at the same time, but in separate groups. By discussing potential problems and issues as a group, the facilitators were able to fashion common responses. The training emphasized that all facilitators of the same intervention must implement it in the same way so as to reduce facilitator effects.

Measures

Risky sexual behavior during the previous 3 months. On the preintervention and follow-up questionnaires, the participants answered a series of questions about their sexual practices in the previous 3 months, including coitus, multiple sexual partners, condom use, and heterosexual anal intercourse. At each assessment, participants' responses to the individual items were converted to z scores and then av-

eraged to form a scale on which higher scores indicated higher incidence of risky sexual behavior. Coefficient α for the scale was .67 at preintervention and .72 at follow-up.

Intentions and attitudes regarding risky sexual behavior in the next 3 months.

The theory of reasoned action and a growing empirical literature suggest that attitudes and intentions are related to behavior, including HIV risk-associated sexual behavior.²³⁻²⁷ The participants' attitudes and intentions regarding engaging in the aforementioned sexual practices in the next 3 months were measured at preintervention, immediately postintervention, and at the 3-month follow-up. To measure intentions, participants were asked to rate the likelihood that they would engage in each behavior in the next 3 months on a scale from "extremely unlikely" (1) to "extremely likely" (7). At each time point, the ratings were averaged to form scales on which higher numbers indicated stronger intentions to engage in risky sexual behavior in the next 3 months. Coefficient α was .68 at preintervention, .72 at postintervention, and .70 at follow-up. To measure attitudes, participants were asked to rate their attitudes toward engaging in each behavior in the next 3 months on a scale from "extremely negative" (1) to "extremely positive" (7). At each time point, the ratings were averaged to form scales on which higher numbers indicated more favorable attitudes toward engaging in risky sexual behavior in the next 3 months. Coefficient α was .63 at preintervention, .68 at postintervention, and .63 at follow-up.

AIDS and STD knowledge. Participants answered factual true-false questions regarding AIDS and STDs. Thirty items concerned AIDS and were taken from scales previously used in research on adolescents by DiClemente et al.^{20,28} Thirty additional items concerned information about either AIDS or STDs in general that is not tapped by the DiClemente measures. To ensure the content validity of the scale, six AIDS experts—scientists and clinicians involved in AIDS-related research, patient care, or education—rated the information in each item on a 3-point scale from "unimportant" (0) to "important" (1) to "essential" (2) for laypersons to know. Eighteen items were seen as essential (mean ratings = 2.0) by every judge, and 39 items had mean ratings in the important to essential range (mean ratings ≥ 1.00). Three items the judges considered either ambiguous or unimportant were deleted. The number cor-

rect out of 57 was calculated from the preintervention, postintervention, and follow-up questionnaires. Coefficient α was .73, .89, and .82, respectively.

Other measures. On the postintervention questionnaire, the participants answered a series of questions about their perceptions of the intervention activities. The facilitators completed a questionnaire regarding their impressions of the experience of the adolescents in their small groups and their success at implementing the intervention. The Marlowe-Crowne Social Desirability Scale²⁹ was used to measure the tendency of participants to describe themselves in favorable, socially desirable terms.

Results

Intervention Integrity

Before considering effects of the AIDS intervention on knowledge, attitudes, intentions, and behavior, it is important to establish that the participants in the two conditions were equally involved in their interventions and found them to be valuable and enjoyable. There were no differences between conditions in the participants' ratings of their liking for the intervention, their learning from the activities, whether the intervention would help them in the future, their general emotional reactions toward the intervention, or their participation level. The only significant difference between the groups was that those in the AIDS condition would be more likely to recommend the project to other teenagers than would those in the careers condition—mean ratings of 4.18 vs 3.78 on a 5-point scale, $F(1, 152) = 4.43$, $P < .04$. The facilitators' ratings of their small groups were consistent with the participants' self-ratings: They revealed a high degree of attentiveness and interest, with no differences between conditions. In addition, there was evidence that the facilitators had been successful in presenting the interventions in the same way. Analyses on knowledge, attitudes, intentions, and behavior revealed no differences that could be attributed to the particular small group in which the adolescents participated, independent of experimental condition.

Knowledge, Attitudes, and Intentions

The data were analyzed with Condition \times Gender of Facilitator analyses of covariance,³⁰ controlling for preintervention measures of the relevant crite-

tion. Table 1 contains the adjusted postintervention means. Immediately after the intervention, participants in the AIDS condition had greater knowledge about AIDS, $F(1, 151) = 19.58, P < .0001$, expressed less favorable attitudes toward risky sexual behaviors, $F(1, 150) = 8.42, P < .004$, and reported weaker intentions to engage in such behavior than did their counterparts in the career-opportunities condition, $F(1, 150) = 17.45, P < .0001$. The Condition \times Gender of Facilitator interaction on knowledge was significant, $F(1, 151) = 4.26, P < .04$, indicating that the degree of increase in knowledge caused by the AIDS intervention was greater with male facilitators than with female facilitators.

Three-month follow-up. Three months after the intervention, participants in the AIDS condition still scored higher on AIDS knowledge, $F(1, 147) = 9.46, P < .003$, and reported weaker intentions to engage in risky sexual behavior in the next 3 months, $F(1, 144) = 7.58, P < .007$, than did those in the career-opportunities condition. Table 2 contains the adjusted means. There was a nonsignificant trend toward less favorable attitudes regarding risky sexual behavior among those in the AIDS condition than among those in the control condition, $F(1, 144) = 2.82, P < .10$. However, a significant Condition \times Gender of Facilitator interaction, $F(1, 144) = 8.91, P < .003$, indicated that the effect of the AIDS intervention on lowering attitudes was greater with female facilitators than with male facilitators.

Risky Sexual Behavior

As Table 2 shows, when preintervention reports of risky sexual behavior are controlled for, participants in the AIDS condition reported engaging in less risky sexual behavior in the 3 months following the intervention than did participants in the career-opportunities condition, $F(1, 135) = 6.48, P < .01$. The Condition \times Gender of Facilitator interaction was significant, $F(1, 135) = 4.19, P < .04$, indicating that the reduction in risky sexual behavior caused by the AIDS intervention was greater with female facilitators than with male facilitators.

Table 3 shows that the effects of the intervention were fairly consistent across different sexual behaviors. Although adolescents in the AIDS condition were not significantly ($P < .10$) more likely than those in the career-opportunities condition to practice complete abstinence in the 3 months postintervention, they did report

Variable	AIDS Prevention Condition	Control Condition	Difference	95% CI of Difference
Knowledge	46.22 (85)	40.37 (71)	5.85	3.23, 8.48
Attitudes	3.02 (83)	3.48 (72)	-.46	-.77, -.15
Intentions	2.83 (83)	3.40 (72)	-.57	-.84, -.30

Note. Numbers of respondents are shown in parentheses. CI = confidence interval. Higher numbers indicate greater AIDS knowledge, more positive attitudes toward behaviors that increase risk of sexually transmitted HIV infection, and stronger intentions to engage in such behaviors.

^a For each variable, the preintervention measure is partialled out of the postintervention measure.

Variable	AIDS Prevention Condition	Control Condition	Difference	95% CI of Difference
Knowledge	47.20 (83)	44.40 (67)	2.8	.72, 4.88
Attitudes	3.13 (82)	3.38 (67)	-.25	-.54, .04
Intentions	2.87 (82)	3.30 (67)	-.43	-.74, -.12
Risky behavior	-.12 (76)	.24 (62)	-.36	-.64, -.08

Note. Numbers of respondents are shown in parentheses. CI = confidence interval. Higher numbers indicate greater AIDS knowledge, more positive attitudes toward behaviors that increase risk of sexually transmitted HIV infection, stronger intentions to engage in such risky behaviors, and more reports of risky sexual behavior.

^a For each variable, the preintervention measure is partialled out of the 3-month follow-up measure.

having coitus on fewer days, with fewer women, and with fewer women who were involved in sexual relationships with other men. Subjects in the AIDS condition also reported fewer occasions of coitus without a condom and were less likely to report having anal intercourse with a woman in the 3 months postintervention than were the other adolescents. Condition \times Gender of Facilitator interactions of the same form as on the aggregate risky behavior index were statistically significant on number of days on which the participants engaged in coitus, number of days on which the participants had coitus without using a condom, and experience with heterosexual anal intercourse in the past 3 months.

Social Desirability Bias

Marlowe-Crowne Social Desirability Scale scores were unrelated to preintervention self-reports, 3-month follow-up self-reports, or amount of change in self-reports of risky sexual behavior. In addition, the scores were unrelated to preintervention, postintervention, or follow-up intentions and attitudes or to changes in these variables.

Discussion

Given the widely recognized potential risk of sexually transmitted HIV among inner-city Black adolescents, the results of the present experiment are encouraging. They suggest that interventions that increase knowledge about AIDS and change attitudes toward risky sexual behavior may have salutary effects on Black adolescents' risk of HIV infection. Compared with their counterparts in the control condition, the inner-city Black male adolescents who were randomly assigned to an AIDS intervention subsequently had lower intentions of engaging in sexual behaviors that would increase their risk of contracting or spreading HIV infection. These adolescents also had less favorable attitudes toward risky sexual behaviors and greater AIDS knowledge. Analyses on data from the 3-month follow-up revealed that the adolescents who received the AIDS intervention also reported engaging in less risky sexual behavior following the intervention than did those who received the control intervention. Moreover, the effects of the intervention on intentions regarding risky sex-

TABLE 3—Adjusted^a Means for Specific Sexual Behaviors, by Experimental Condition

Variable	AIDS Prevention Condition	Control Condition	Difference	95% CI of Difference
Coitus ^b	.48 (62)	.60 (53)	-.12	-.27, 0.3
No. days respondent had coitus	2.15 (53)	5.48 (47)	-3.32	-5.78, -.89
No. coital partners	.85 (63)	1.79 (52)	-.93	-1.53, -.33
No. coital partners involved with other men	.19 (60)	1.75 (48)	-1.55	-2.67, -.43
Rated frequency of condom use ^c	4.35 (22)	3.50 (21)	.85	.14, 1.56
No. days respondent did not use condom during coitus	.64 (58)	2.38 (48)	-1.73	-2.86, -.60
Heterosexual anal sex ^b	.07 (68)	.27 (49)	-.19	-.32, -.06
No. days respondent had heterosexual anal sex	.36 (64)	.92 (46)	-.55	-1.17, .07
No. female anal sex partners	.13 (65)	.61 (49)	-.47	-.86, .08

Note. Numbers of respondents are shown in parentheses. CI = confidence interval.

^a For each variable, the preintervention measure is partialled out of the 3-month follow-up measure.

^b Coitus and heterosexual anal sex are dummy coded so that 1 = "yes" and 0 = "no."

^c Frequency of condom use was rated on a 5-point Likert-type scale from 1 = "never" to 5 = "always."

ual behavior and AIDS-related knowledge were sustained over the 3 months. The effects on attitudes observed immediately postintervention were evident at the follow-up among participants who had a female facilitator.

These results cannot be explained as a simple result of the special attention received by the adolescents in the AIDS intervention condition. The two interventions were matched in length and involved similar kinds of activities. Moreover, the participants' evaluations of their experiences were quite similar across the interventions. Although career-opportunities subjects did not learn about AIDS, they did gain knowledge that would be valuable to them in the future, given the high unemployment among inner-city Black adolescents.

By its very nature, risky sexual behavior is private behavior and consequently must be assessed using self-report measures, which may be biased.³¹ We employed several techniques to make it less likely that the subjects would minimize or exaggerate reports of their sexual experiences: (1) code numbers rather than names were used on the questionnaires, (2) facilitators were not involved in any way in the administration of questionnaires, (3) the importance of responding honestly was emphasized, and (4) participants were assured that their responses would be kept confidential. Furthermore, if concern about how they would be viewed by others influenced respondents' reports of their sexual behavior, those whose need for social approval was stronger²⁹ might have differed from the other adolescents in self-reported risky sexual behavior or in the change in their reports

after the AIDS intervention. Responses, however, were unrelated to social desirability bias. Nevertheless, because it is difficult to validate self-reported sexual behavior,³¹ interpretations of the present findings should take into consideration the possibility that the participants' self-reports might have been inaccurate.

It might be argued that the gender of facilitators and group members should be matched to enhance an intervention's effectiveness. Consonant with this argument, the AIDS intervention caused greater increases in postintervention AIDS knowledge when the facilitator was male than when the facilitator was female. But this advantage of male facilitators was not evident on postintervention attitudes or intentions, and it vanished at follow-up. In fact, 3-month follow-up data revealed that the AIDS intervention caused less self-reported risky behavior and less positive attitudes toward such behavior when the facilitator was female than when the facilitator was male. These results provide scant support for the view that matching the gender of facilitator and intervention recipient enhances the effectiveness of AIDS interventions with Black male adolescents.

One common argument against AIDS education programs for adolescents and children has been that exposing them to information about sex will encourage them to engage in sexual activity. Our data, however, provide some evidence that the opposite may be true. Adolescents who received the AIDS intervention were less likely to engage in sexual activity, and those who did were more likely to engage in safer sexual activity. Thus, the common fear that providing adolescents

with information about AIDS will result in greater sexual activity is perhaps simply a fear.

The present study focused on sexual behaviors that heighten risk of HIV infection. However, the overwhelming majority of the subjects did not report any homosexual or bisexual experiences. Sharing needles and other intravenous drug use paraphernalia would also increase risk of HIV infection, but few of these subjects reported engaging in such behavior. The important question of whether interventions of the type used in the present study would be effective with Black male adolescents who engage in homosexual or bisexual activities or who use intravenous drugs will have to be addressed in future studies. More broadly, research on strategies to change HIV risk-associated behavior in diverse populations is still in its infancy. We are optimistic, however, that by conducting research along these lines, it may be possible to curb the spread of AIDS. □

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